

*FURTHER EVALUATION OF LEISURE ITEMS IN THE ATTENTION  
CONDITION OF FUNCTIONAL ANALYSES*

EILEEN M. ROSCOE, ABBEY CARREAU, JACKIE MACDONALD, AND SACHA T. PENCE

NEW ENGLAND CENTER FOR CHILDREN  
NORTHEASTERN UNIVERSITY

Research suggests that including leisure items in the attention condition of a functional analysis may produce engagement that masks sensitivity to attention. In this study, 4 individuals' initial functional analyses indicated that behavior was maintained by nonsocial variables ( $n = 3$ ) or by attention ( $n = 1$ ). A preference assessment was used to identify items for subsequent functional analyses. Four conditions were compared, attention with and without leisure items and control with and without leisure items. Following this, either high- or low-preference items were included in the attention condition. Problem behavior was more probable during the attention condition when no leisure items or low-preference items were included, and lower levels of problem behavior were observed during the attention condition when high-preference leisure items were included. These findings suggest how preferred items may hinder detection of behavioral function.

DESCRIPTORS: assessment, autism, functional analysis, problem behavior

The functional analysis model proposed by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) has had a substantial impact on the assessment and treatment of problem behavior. By determining the contingencies that maintain problem behavior, functional analyses allow the development of effective function-based treatments (Iwata et al., 1994). Since the advent of this procedure, several direct and systematic replications across populations, settings, and topographies have been reported (Hanley, Iwata, & McCord, 2003). In this general model, test conditions that contain an establishing operation (Michael, 1982), a discriminative stimulus, and a source of reinforcement are alternated with a control condition (that removes the establishing operation and consequences present in the test conditions) to identify the maintaining variables for problem behavior. Data are typically interpreted through visual inspection, and differentiated outcomes are determined based on levels of problem

behavior observed during each test condition relative to the control condition. For example, differentially higher levels of behavior during the attention condition would suggest maintenance by social-positive reinforcement. When differentiated outcomes are obtained, the relevant consequence can be altered as treatment for the problem behavior.

Although functional analyses have been reported to frequently produce differentiated outcomes (Derby et al., 1992; Iwata et al., 1994; Vollmer, Marcus, Ringdahl, & Roane, 1995), unclear outcomes (e.g., variable and low levels of behavior across conditions) have been observed, reducing the likelihood of identifying a maintaining variable. To enhance the likelihood of obtaining informative results, a number of procedural refinements have been developed. One such adaptation involves manipulating specific aspects of antecedent events that may affect functional analysis outcomes (Berg et al., 2000; O'Reilly et al., 2006; Smith, Iwata, Goh, & Shore, 1995).

For example, O'Reilly (1999) observed higher levels of problem behavior during an attention condition following a period in which access to attention was restricted than when

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Address correspondence to Eileen M. Roscoe, Assistant Director of Research, New England Center for Children, 33 Turnpike Rd., Southborough, Massachusetts 01772 (e-mail: [eroscoe@necc.org](mailto:eroscoe@necc.org)).

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attention was continuously presented prior to a session. Smith et al. (1995) examined the effects of manipulating antecedent events associated with the demand condition, including task novelty, session duration, and rate of task presentation. Results showed that presentation of novel demands, increases in session length, and increases in the rate of task presentation resulted in increases in escape-maintained behavior for some of the participants.

Another variable that may affect differentiation in functional analysis outcomes is the inclusion of leisure items during the attention condition. Although leisure items are typically included during the attention condition to decrease the likelihood of observing automatically reinforced problem behavior, the inclusion of preferred items may mask detection of attention as the maintaining reinforcer. A study that raised this possibility was conducted by Vollmer et al. (1995), who found clear functional analysis outcomes for 17 of 20 individuals referred for assessment and treatment of severe behavior problems. For the 17 individuals for whom a clear outcome was obtained, attention was never identified as a maintaining variable. The authors noted that one explanation for this finding was that they included preferred stimuli (based on the results of a preference assessment) during the attention condition, and that these items may have competed with attention as a source of positive reinforcement. It is possible that attention would have served as a reinforcer for some of these participants if preferred items were not available concurrently.

McCord and Neef (2005) reviewed articles published during a 10-year period (from 1994 to 2003) in the *Journal of Applied Behavior Analysis* and determined how many used leisure items during the attention condition of functional analyses. The authors found that 87 of 165 studies (53%) included leisure items during the attention test condition, and of the 87 studies that included leisure items, only five

(6%) reported use of a stimulus preference assessment to aid in item selection. Thus, although leisure items are often included in the attention condition of a functional analysis, the items included are usually of unknown preference. The authors suggested that although the inclusion of items during the attention condition minimizes the occurrence of behavior maintained by automatic reinforcement, it is possible that the availability of leisure items may sometimes compete with attention-maintained behavior, masking this potential function of problem behavior. In addition, the authors noted that because few studies have reported using preference assessments for item selection, the items included during the attention condition may have been nonpreferred, increasing the likelihood of false-positive identification of attention as a reinforcer (i.e., behavior observed in this condition may have been maintained by automatic reinforcement).

Recent research more directly suggests that the inclusion of preferred leisure items may mask detection of attention as a reinforcer. Ringdahl, Winborn, Andelman, and Kitsukawa (2002) evaluated the effects of providing continuous access to preferred items during the attention condition. A modified functional analysis was conducted that included three conditions: a control condition and two variants of the attention condition. During the control condition, the therapist delivered attention independent of responding, preferred leisure items were available continuously, and instances of the target behavior were ignored. During the attention-only condition, the therapist delivered 30 s of attention following instances of the target behavior, and no leisure items were available. During the attention-enriched condition, the therapist delivered 30 s of attention following each instance of the target behavior, and preferred leisure items were available continuously. Results indicated higher levels of problem behavior during the attention-only

condition than in the attention-enriched condition, suggesting that the availability of preferred leisure items in the functional analysis may have abolished or competed with attention as a reinforcer, resulting in false-negative outcomes. However, it is unclear how the inclusion of preferred items would have affected outcomes for participants whose behavior was maintained by automatic reinforcement. Also, the authors did not report how preferred leisure items were identified, and it is unclear whether behavior may have been sensitive to automatic reinforcement because an alone condition was not included.

Although research has shown that the inclusion of high-preference (HP) items in the attention condition may result in false-negative outcomes for attention-maintained problem behavior, it is also possible that the omission of items during the attention condition may result in false-positive identification of attention as a maintaining variable for behavior maintained by automatic reinforcement. In addition, it is unclear how the inclusion of items of varying preference value may affect outcomes. The purpose of the current study was to replicate and extend findings by Ringdahl et al. (2002). First, items used during the attention condition of the functional analysis were selected based on the results of a duration-based preference assessment that involved simultaneous measurement of item engagement and problem behavior similar to that used by Piazza, Fisher, Hanley, Hilker, and Derby (1996). Second, we evaluated whether the inclusion of HP items during the attention condition affected outcomes for individuals with behavior maintained by attention or automatic reinforcement based on the outcomes of previous functional analyses. Third, we assessed whether including leisure items with different preference values (i.e., HP vs. low-preference [LP] items) affected functional analysis outcomes for individuals with problem behavior maintained by attention or by automatic reinforcement.

## METHOD

### *Participants and Setting*

The participants were 2 boys and 2 girls who had been diagnosed with an autism spectrum disorder; they had been referred by service providers as exhibiting problem behavior that interfered with their participation in educational activities. All participants attended a residential school for individuals with developmental disabilities.

Jake was an 8-year-old boy who exhibited hand biting. His primary modes of communication were through the use of a picture exchange communication system (PECS) and a speech-generating device. Beth was a 12-year-old girl who exhibited motor stereotypy. She communicated using one-word vocal utterances or complete sentences with a speech-generating device. Amy was a 9-year-old girl who exhibited a finger tapping stereotypy. She communicated using one- to two-word vocal utterances and PECS. Carl was a 12-year-old boy who exhibited shirt twirling. He communicated using one- to two-word utterances and PECS. All of the participants followed one- to two-step instructions. Carl and Beth exhibited independent self-help skills (toileting, grooming, dressing, feeding).

All sessions were conducted in a room (1.5 m by 3 m) and equipped with a wide-angle video camera, a microphone, videorecording equipment, materials necessary to conduct the experimental conditions, and an appropriately sized table with one or two chairs.

### *Response Measurement and Interobserver Agreement*

*Self-Biting* (Jake) was defined as putting one or more of his fingers into his mouth and biting down such that his upper and lower teeth made contact with his fingers. *Motor stereotypy* (Beth) was defined as repetitive movement of any or all body parts including rocking or swaying of torso, head, feet or body; jumping; hand flapping or posturing; finger rubbing; fanning

or spreading of fingers; putting fingers in or over ears, mouth, or corner of eyes. *Tapping* (Amy) was defined as any instance of her hands or an object in her hands coming into contact with another surface two or more times within a 2-s period. *Shirt twirling* (Carl) was defined as holding onto his shirt with two or more fingers while moving his wrist or arm in a back-and-forth motion.

Previously trained graduate students or undergraduate students served as observers who collected data by hand using data sheets. Data on hand biting were recorded using a frequency measure during all assessments. Data on motor stereotypy, tapping, and shirt twirling were recorded using 10-s momentary time sampling during all assessments. Data on item engagement (collected during the initial preference assessment) were recorded using 10-s momentary time sampling. For every 10 s of session time, an observation of 2 s occurred during which the occurrence or nonoccurrence of the behavior was recorded. Momentary time-sampling data were converted to percentage occurrence by dividing the number of intervals in which an occurrence was scored by the number of 10-s intervals in the session.

Interobserver agreement was assessed by having a second observer independently record behavior. Agreement for frequency data was calculated by dividing each session into consecutive 10-s intervals. Intervals in which the same number was scored by both observers were assigned a value of 1. Intervals in which one observer scored 0 target responses and the other scored anything other than 0 were assigned a value of 0. For intervals in which different numbers were scored, the smaller number of responses scored was divided by the larger number. The mean was calculated for the values generated for each interval, and this number was converted to a percentage. Interobserver agreement for momentary time-sampling data was calculated by dividing the number of agreements by the total number of agreements

plus disagreements and converting this ratio to a percentage. During the functional analysis, agreement was measured during 37%, 56%, 21%, and 46% of functional analysis sessions, and mean agreement was 97% (range, 93% to 100%), 93% (range, 85% to 100%), 95% (range, 92% to 100%), and 98% (range, 95% to 100%) for Jake, Beth, Amy, and Carl, respectively. During the preference assessment, agreement was measured during 40% of sessions, and mean agreement was 95% (range, 73% to 100%) and 99% (range, 93% to 100%) for problem behavior and item engagement, respectively. During the leisure-item analysis and the preferred or nonpreferred leisure-item analysis, agreement was measured during 47%, 34%, 31%, and 32% of sessions, and mean agreement was 96% (range, 84% to 100%), 92% (range, 83% to 100%), 98% (range, 92% to 100%), and 98% (range, 97% to 100%) for Jake, Beth, Amy, and Carl, respectively.

### *Procedure*

*Functional analysis.* An experimental analysis based on procedures described by Iwata *et al.* (1982/1994) was conducted. Three or four conditions were arranged in a multielement design. For Jake, no-interaction, attention, demand, and control conditions were conducted. For Beth, Amy, and Carl, alone, attention, and demand sessions were conducted with a 2:1 ratio of alone to attention or demand sessions. Because it seemed likely that their stereotypy was maintained by automatic reinforcement, the play condition was omitted, and an extended series of alone sessions (similar to that used by Vollmer *et al.*, 1995) was conducted to verify that stereotypy persisted in the absence of social consequences. However, periodic probes of attention and demand test conditions were conducted. If behavior persisted in social conditions and was low in the alone condition, further analyses would have been conducted to determine whether the behavior was socially maintained. However, this pattern was not observed for Beth, Amy, and Carl.

During the alone/no-interaction condition, the participant was alone in the room or at least 1 m away from observers, and no materials were available. No attention or other programmed consequences were arranged.

During the attention condition, all participants (except Jake) were provided with continuous access to preferred leisure items. At the start of each session, the therapist stated that he or she "had work to do." Contingent on the occurrence of the target response, the therapist delivered brief verbal and physical attention (e.g., saying "Don't do that, you're going to hurt yourself" or "Don't do that, that doesn't look nice" paired with a light touch to the shoulder).

During the control condition, the participant was provided with continuous access to preferred leisure items. In addition, the therapist presented brief vocal and physical attention on a fixed-time 15-s schedule (or more frequently if initiated by the participant). No programmed consequences were delivered for the target behavior.

During the demand condition, instructions were presented continuously, using a three-step prompting hierarchy (i.e., vocal, gestural, and physical prompts). Contingent on compliance, the participant received brief praise (e.g., "nice work"). Contingent on the target response, the therapist said "you don't have to," delivered no instruction or task materials, and turned away from the participant for 15 s.

*Preference assessment.* Prior to conducting the leisure-item and preference analyses, a preference assessment was conducted for each participant to identify HP and LP leisure items for inclusion in the attention and control conditions. A duration-based preference assessment similar to that described by Piazza et al. (1996) was used. Each item was singly presented, and the participant had continuous access to the item during four 3-min sessions (Beth) or during two 5-min sessions (all other participants). In addition to problem behavior, item

engagement was measured during the preference assessment. *Item engagement*, defined as contact between the participant's hands and the item, was measured using 10-s momentary time sampling. Items associated with the highest levels of item engagement and the lowest levels of problem behavior were identified as HP items, whereas items associated with the lowest levels of item engagement and the highest levels of problem behavior were identified as LP items. However, in some cases, items that were associated with higher levels of problem behavior were identified as HP as long as they were associated with at least 80% engagement, and items that were associated with lower levels of problem behavior were identified as LP as long as they were associated with no more than 50% item engagement.

*Leisure-item analysis.* During this assessment, four conditions (two types of attention conditions and two types of control conditions) were alternated in a random order, and a multielement design was used to demonstrate experimental control.

During the attention/HP items condition, procedures were identical to those described above for the attention condition. That is, participants were provided with continuous access to HP leisure items based on the results of the preference assessment. At the start of each session, the therapist stated that he or she "had work to do." Contingent on the occurrence of the target response, the therapist delivered brief verbal and physical attention as described previously.

During the attention/no-items condition, procedures also were identical to those described above; however, no leisure items were present. This condition was designed to test whether the absence of items during the attention condition resulted in different outcomes than when items were present during the attention condition.

During the control/HP items condition, procedures were identical to those described



above for the control condition. That is, the participant was provided with continuous access to the same HP items present during the attention/HP items condition. In addition, the therapist presented brief vocal and physical attention on a fixed-time 15-s schedule (or more frequently if initiated by the participant). No programmed consequences were delivered for the target behavior.

During the control/no-items condition, procedures were also identical to those described above; however, no leisure items were presented. This condition was designed to test if noncontingent attention alone (without leisure items as in the standard control condition) resulted in similar outcomes to the attention/no-items condition. Low levels of problem behavior during this condition would provide additional support that problem behavior was maintained by social-positive reinforcement because noncontingent attention served as an abolishing operation, whereas high levels of behavior during this condition would provide additional support that participants' problem behavior was not maintained by social-positive reinforcement because noncontingent attention did not serve as an abolishing operation.

*Preferred-item analysis.* Three of the 4 participants were included in the preferred-item analysis. During this assessment, three conditions (two types of attention and one type of control condition) were alternated in a random order, and a multielement design was used to demonstrate experimental control.

During the attention/HP items condition, procedures were identical to those described above for the attention/HP items condition in the leisure-item analysis. During the attention/LP items condition, procedures were also identical to those described above; however, LP items rather than HP items were available continuously. This condition was designed to test whether the inclusion of LP items resulted in higher levels of problem behavior during the attention condition for the participant previ-

ously identified as having attention-maintained problem behavior and in lower levels of problem behavior during the attention condition for participants previously identified as having automatically reinforced problem behavior. During the control/HP items condition, procedures were identical to those described above.

## RESULTS

Results for the initial functional analysis for all participants are depicted in Figure 1. For Jake, hand biting occurred at differentially higher levels during the attention and demand conditions, indicating that his behavior was maintained by social-positive reinforcement in the form of attention and by social-negative reinforcement in the form of escape. Motor stereotypy for Beth, tapping for Amy, and shirt twirling for Carl occurred at differentially higher levels in the alone condition than in demand and attention conditions, suggesting that these stereotypies were maintained by automatic reinforcement. However, shirt twirling for Carl was low and variable during the last few alone sessions. Following the initial functional analysis, an extended series of alone sessions was conducted, which showed that shirt twirling persisted in the absence of social consequences.

The results of the preference assessment for all participants are depicted in Figure 2. Stimuli are ordered based on their associated levels of item engagement (highest to lowest). In general, items associated with the highest levels of item engagement and the lowest levels of problem behavior were selected for inclusion in the subsequent functional analyses. For Jake, toy trains were identified as the HP item and a stuffed dog was identified as the LP item. Because he did not engage in problem behavior during the preference assessment, only item engagement was used for determining item selection. A toy train was selected over jacks and watersnake because it resulted in similarly high levels of item engagement and was associated

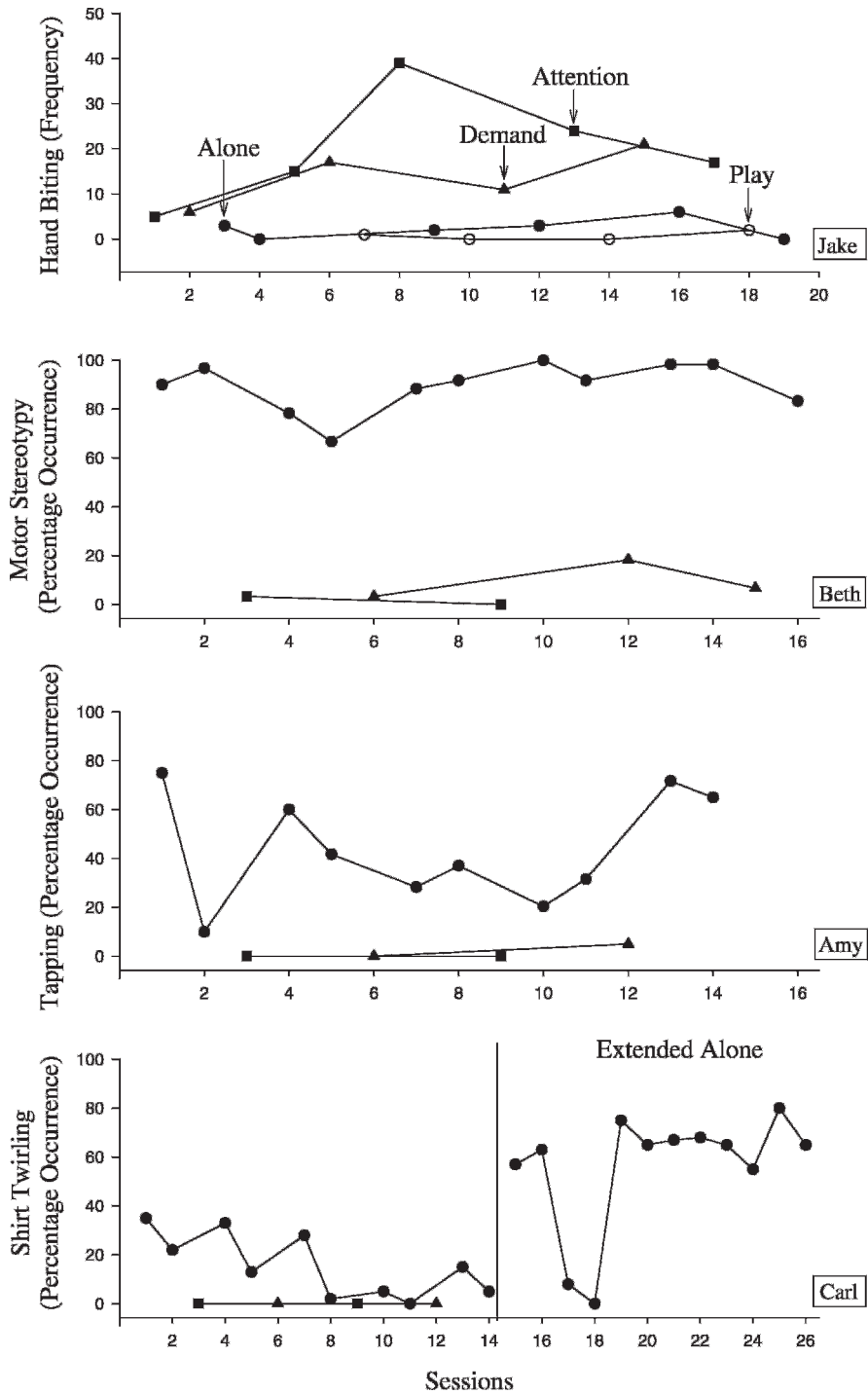


Figure 1. Frequency of hand biting and percentage occurrence of motor stereotypy, tapping, and shirt twirling during functional analyses for Jake, Beth, Amy, and Carl, respectively.

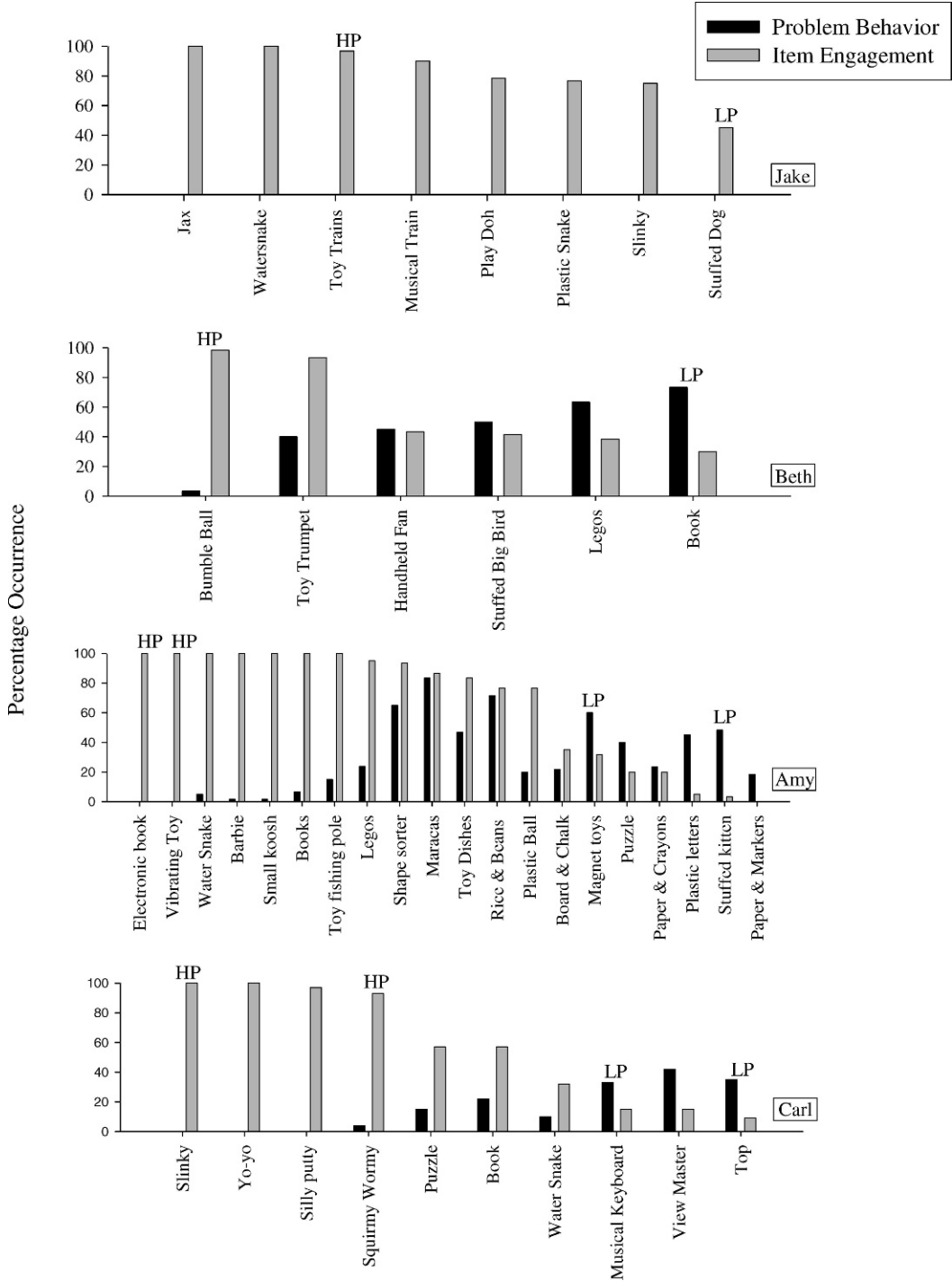


Figure 2. Percentage occurrence of problem behavior and item engagement during the preference assessment for Jake, Beth, Amy, and Carl.



with more appropriate item engagement. For Beth, a bumble ball was identified as the HP item and a book was identified as the LP item. For Amy and Carl, two HP items (electronic book and a vibrating toy for Amy, Slinky and squirmy wormy for Carl) and two LP items (magnet toys and a stuffed kitten for Amy, musical keyboard and top for Carl) were identified for use during the subsequent functional analyses.

The results of the leisure-item analysis for all participants are depicted in Figure 3. For Jake, hand biting occurred at higher levels during the attention/no-items condition than in the attention/HP items, control/HP items, and control/no-items conditions. In the absence of other data, the lower levels of problem behavior observed during the attention/HP items condition might be interpreted as suggesting that biting was not maintained by attention, an outcome that is inconsistent with results from his initial functional analysis (in which leisure items were not included in the attention condition). Higher levels of biting observed during the attention/no-items condition suggest that biting was maintained by attention, an outcome that is consistent with results from his previous functional analysis. In addition, lower levels of biting were observed during the control/no-items condition, suggesting that noncontingent attention alone suppressed biting, providing further support that biting was maintained by attention.

Results of the leisure-item analysis were similar for Beth, Amy, and Carl. For each of these participants, the target behavior occurred at higher levels during the attention/no-items and the control/no-items conditions than during the attention/HP items and the control/HP items conditions. Lower levels of problem behavior observed during the attention/HP items condition suggest that their behavior was not maintained by attention, an outcome that is consistent with results from their initial functional analyses. In the absence

of other data, elevated levels of problem behavior observed during the attention/no-items condition may be interpreted as suggesting behavioral maintenance by attention, an outcome that is not consistent with results from participants' initial functional analyses. In addition, the high levels of problem behavior observed in the control/no-items condition suggested that noncontingent attention alone did not suppress this behavior. This provides further support that these participants' target behavior was not maintained by attention.

The results of the preferred-item analysis for Jake, Carl, and Amy are depicted in Figure 4. For Jake, biting occurred at higher levels during the attention/LP items condition than during the attention/HP items and control/HP items conditions. In the absence of other data, lower levels of biting during the attention/HP items condition might be interpreted as suggesting that his behavior was not maintained by attention, an outcome that is inconsistent with results from his initial functional analysis (in which toys were not included in the attention condition). Elevated levels of biting observed during the attention/LP items condition suggest that biting was maintained by attention, an outcome that is consistent with results from his initial functional analysis. These findings indicate that including HP items in the attention condition may mask detection of attention-maintained behavior, whereas the inclusion of LP items did not have such an effect.

Results of the preferred-item analysis were similar for Amy and Carl. For each of these participants, the target behavior occurred at higher levels during the attention/LP items condition than during the attention/HP items and control/HP items conditions. Lower levels of problem behavior during the attention/HP items condition suggested that target behavior was not maintained by attention, an outcome that is consistent with results from their initial functional analyses. In the absence of other data, elevated levels of problem behavior

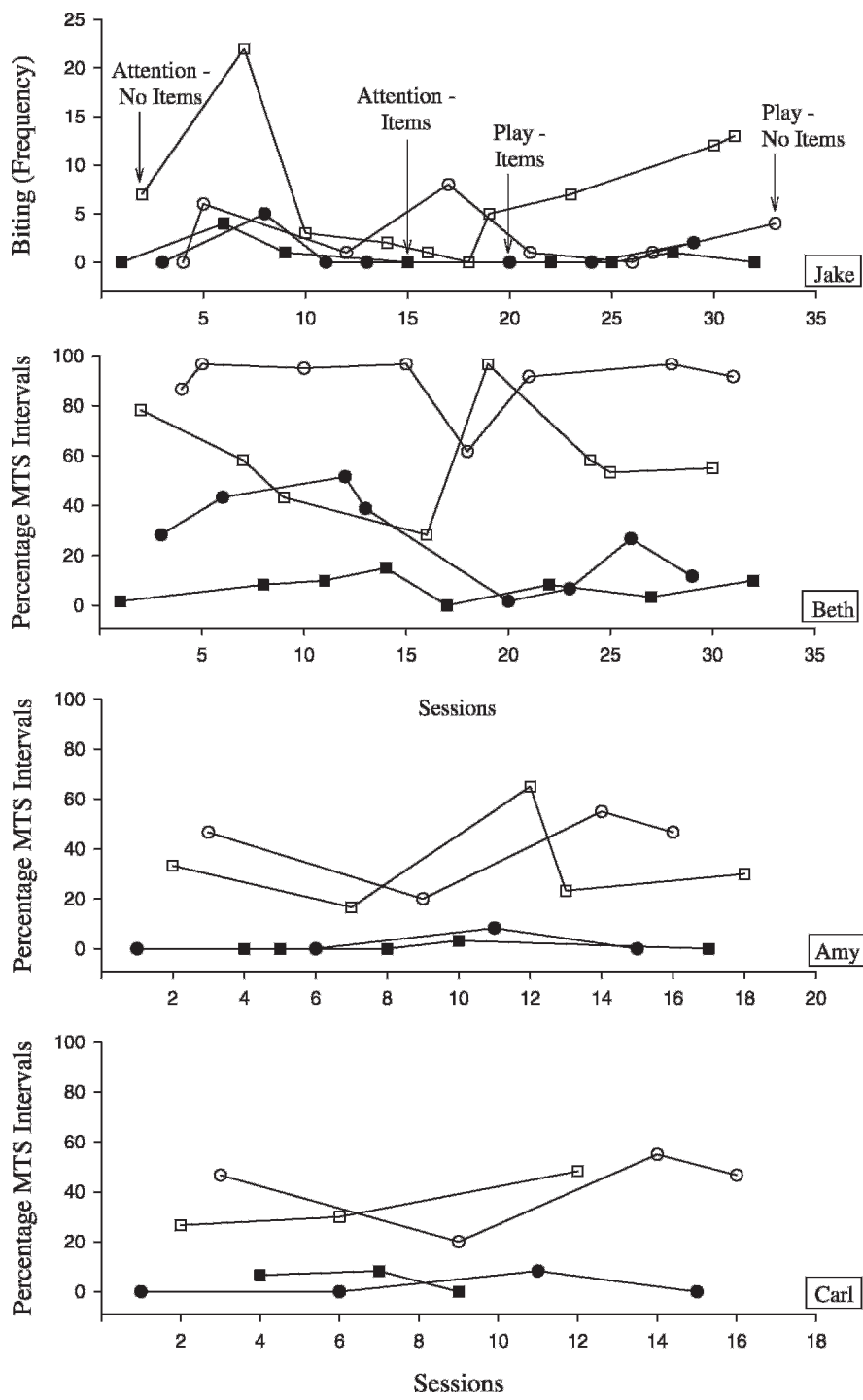


Figure 3. Frequency of hand biting and percentage occurrence of motor stereotypy, tapping, and shirt twirling during the leisure-item analysis for Jake, Beth, Amy, and Carl, respectively.

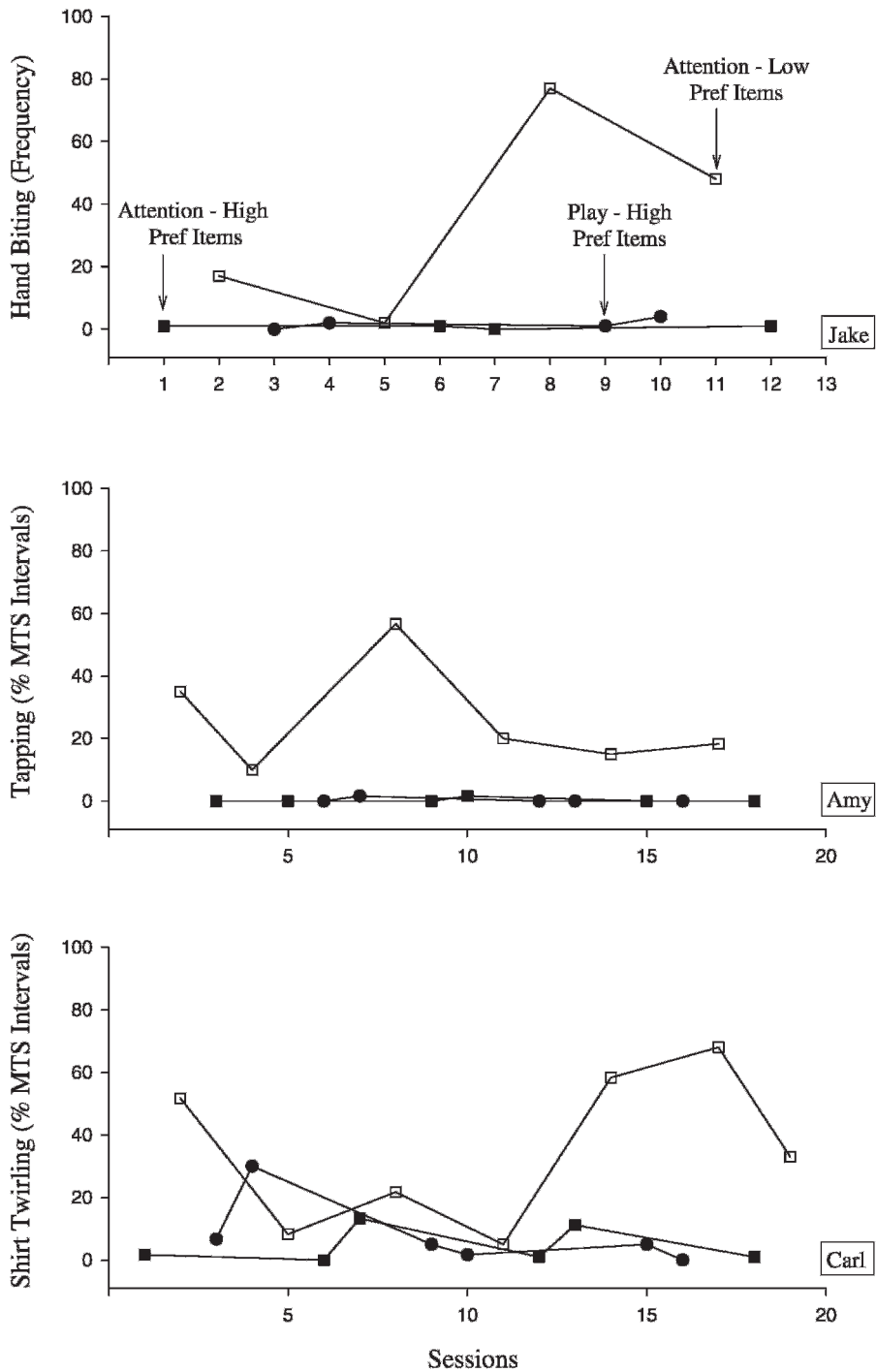


Figure 4. Frequency of hand biting and percentage occurrence of tapping and shirt twirling during the preferred-item analysis for Jake, Amy, and Carl, respectively.

observed during the attention/LP items condition might be interpreted as suggesting behavioral maintenance by attention, an outcome that is not consistent with results from the initial functional analyses. These findings indicate that including LP items in the attention condition may not eliminate the establishing operation for automatically reinforced behavior (i.e., deprivation from sensory stimulation persists in the presence of LP items). By contrast, including HP items in the attention condition may have resulted in a finding consistent with the outcomes from the initial functional analysis by terminating the establishing operation for automatically reinforced behavior. This also suggests a method for treating problem behavior.

## DISCUSSION

The present study found that the inclusion of leisure items during the attention condition of the functional analysis in some cases facilitated and in other cases impeded identification of the function of problem behavior. For participants whose problem behavior was maintained by automatic reinforcement, the inclusion of leisure items in the attention condition facilitated clear detection of the behavior's maintaining variable. However, for the participant whose problem behavior was maintained by attention, the inclusion of HP leisure items hindered detection of the behavior's maintaining variable.

These findings were consistent with those reported by Ringdahl *et al.* (2002) for the participant whose problem behavior was maintained by attention. That is, noncontingent access to leisure items during the attention condition resulted in low levels of behavior during attention (a false-negative outcome). The present results also extended the findings of Ringdahl *et al.* in a number of ways. First, an initial functional analysis that included an alone condition was conducted prior to the leisure-item analysis to identify whether behavior was maintained by attention or automatic reinforce-

ment. Second, a duration-based leisure-item assessment was conducted to identify items that were highly preferred (defined as those resulting in high engagement and low problem behavior). Third, we included 3 participants whose behavior was maintained by automatic reinforcement to determine how the inclusion of leisure items during the attention condition affected automatically reinforced behavior.

In addition, the effects of using leisure items of varying preference was evaluated to identify a potential solution to the confounding effect produced by including leisure items during the attention condition of the functional analysis. Results of such analyses may indicate whether lower preference items can serve as an abolishing operation for the response product of behavior maintained by automatic reinforcement while not competing with attention-maintained problem behavior. Ringdahl *et al.* (2002) suggested that the use of leisure items of different preference (i.e., not HP items) may lead to a better procedure for obtaining clear outcomes from functional analyses. Results from the preferred-item analysis showed that levels of behavior during the attention/LP items condition were as high as those obtained in the attention/no-items condition. This suggested a consistent outcome for Jake, whose behavior was maintained by attention, but an inconsistent outcome for Carl and Amy, whose behavior was maintained by automatic reinforcement. Moreover, problem behavior occurred at low levels during the attention/HP items condition (suggesting an inconsistent outcome for Jake and a consistent outcome for Carl and Amy). Thus, as suggested by McCord and Neef (2005), it was difficult to identify items that would simultaneously control for automatically reinforced behavior while not impeding detection of an attention function.

The present findings have a number of implications for whether or not to include HP or LP leisure items (or no items) in functional analyses. For example, including HP leisure

items in the attention and control conditions may yield a false-negative outcome for attention-maintained problem behavior (i.e., low levels of behavior during the attention condition when attention is the maintaining variable). However, including HP items during attention and control conditions could yield correct identification of automatically reinforced behavior (i.e., low levels of behavior during the attention condition when attention is not the maintaining variable). By contrast, if HP items are included in only the control condition (and LP items or no items are used during the attention condition), attention-maintained problem behavior would be identified correctly, avoiding a false-negative outcome for attention. However, including LP or no items during attention may lead to false-positive identification of an attention function for behavior that is maintained by automatic reinforcement (i.e., elevated levels of behavior would be observed in both the attention and alone conditions).

Results of the present study demonstrate the utility of including a control/no-items condition (i.e., noncontingent attention). When problem behavior was maintained by attention, low levels of problem behavior were observed in the control/no-items condition, whereas when problem behavior was maintained by automatic reinforcement, high levels were observed in this condition. Based on this information, one possibility would be to remove items from the attention condition when conducting a functional analysis. If problem behavior occurs at high levels during the attention and alone conditions, an extended alone condition could be conducted (Vollmer et al., 1995) with the possible addition of a control/no-items condition. If problem behavior decreases across successive sessions during the extended alone condition and is low in the control/no-items condition, this would provide additional support that this behavior was maintained by attention. By contrast, if problem behavior is

maintained during the extended alone condition and is high during the control/no-items condition, this would suggest that the problem behavior was, most likely, not maintained by attention but by automatic reinforcement, because extinction did not occur during the extended alone condition and because noncontingent attention during the control condition did not act as an abolishing operation.

Although not the focus of the current study, the present findings extend research on noncontingent reinforcer delivery of HP stimuli for treatment of attention-maintained problem behavior. Noncontingent presentation of HP stimuli has been shown to reduce problem behavior maintained by attention when combined with extinction (Hanley, Piazza, & Fisher, 1997) and when extinction was not in effect (Fischer, Iwata, & Mazaleski, 1997). The findings obtained for Jake during the leisure-item and preferred-item analyses replicate those found by Fischer et al. That is, lower levels of problem behavior were observed during the attention/HP items condition than during the attention/no-items condition, demonstrating that the continuous presentation of HP items may reduce problem behavior even when it continues to be reinforced by attention. Results obtained for Jake during the preferred-item analysis also replicate findings by Fisher, O'Connor, Kurtz, DeLeon, and Gotjen (2000), who showed that noncontingent presentation of stimuli reduced attention-maintained behavior in the absence of extinction when HP stimuli (but not LP stimuli) were used. Thus, the present findings provide additional support for the use of noncontingent presentation of HP stimuli for treating attention-maintained problem behavior.

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